

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION

CLEANUP AND ABATEMENT ORDER NO. 6-98-21

**REQUIRING MOLYCORP, INC.;**  
**TO CLEAN UP AND ABATE THE EFFECTS OF WASTE DISCHARGES**  
**TO THE GROUND WATER OF THE**  
**IVANPAH VALLEY (IVANPAH HYDROLOGIC UNIT)**  
**FROM THE**  
**OLD IVANPAH DISPOSAL POND SITE**

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San Bernardino County

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The California Regional Water Quality Control Board, Lahontan Region (Regional Board), finds:

1. Discharger

Molycorp Inc. (Molycorp) operates a mine and mill in Mountain Pass (Mountain Pass Mine and Mill), which recovers and produces various compounds/products from lanthanide metals. For the purpose of this Cleanup and Abatement Order, Molycorp is referred to as the Discharger.

2. Facility

Molycorp generates wastewater at its Mountain Pass Mine and Mill. In 1980 and 1981, the Discharger constructed the Old Ivanpah Disposal Ponds on a 140-acre site located in Ivanpah Valley for wastewater disposal. The Old Ivanpah Disposal Ponds are now closed. For purposes of this Cleanup and Abatement Order, the 140-acre site is referred to as the Old Ivanpah Disposal Pond Site (site). The site is located approximately 10 miles east of Mountain Pass on the alluvial fan southwest of Ivanpah (Dry) Lake Bed. In 1980, the Discharger also constructed a 10-mile underground and above-ground outfall pipeline to the site. Since 1980, the outfall pipeline has been used to transport a portion of the wastewater generated at the Discharger's Mountain Pass Mine and Mill to the Old Ivanpah Disposal Ponds.

The Old Ivanpah Disposal Ponds consist of two adjacent rectangular ponds referred to as the North and South Pond. In-situ clayey soils were used to construct a 12-inch compacted liner for the ponds. During pond construction, the Discharger used an unlined ground surface area (low spot) located on the site to temporarily dispose of wastewater discharged from the outfall pipeline. The unlined ground surface area is located adjacent to the west edge of the South Pond.

Ground water monitoring wells constructed in 1985 indicate wastewater discharged to the site leaked to ground water. In 1988, the discharge location was shifted to the New Ivanpah Disposal Ponds, located about three miles north.

Wastewater discharged from the outfall pipeline is high in total dissolved solids (TDS). Over 95 percent of the TDS mass is due to the following dissolved constituents, listed in order of prevalence: chloride, sodium, calcium, strontium, sulfate and nitrate. The wastewater also contains concentrations of the following additional parameters above the background quality for ground waters in the area: barium, lead, gross alpha, gross beta, radium, thorium and uranium. Pipescale may be also discharged from the outfall pipeline, mainly during operations to clean the interior surface of the pipeline. The pipescale contains concentrations of the following parameters above background levels for soils in the area: strontium, barium, lead, gross alpha, gross beta, radium, thorium and uranium.

### 3. Location

The Old Ivanpah Disposal Pond Site and Monitoring Wells (except those described below) are located in Section 33, T16N, R15E and Section 21, T152N, R15E, SBB&M; San Bernardino County. The Discharger owns the land where these Facilities are located.

Ground Water Monitoring Wells ME-3 and IER-2 & 3 are located in Sections 28, 32 and 33, T16N, R15E; SBB&M. The land where these wells are located is owned by the US Department of the Interior and administered by the Bureau of Land Management (BLM).

### 4. Waste Discharge Requirements

Revised Waste Discharge Requirements (WDRs) for the Old Ivanpah Disposal Pond Site are prescribed by the Regional Board in Board Order No. 6-90-56 (WDID No. 6B369006001), which was adopted on September 13, 1990.

### 5. Impact to Water Quality

Ground water monitoring by the Discharger indicates wastewater discharged to the Old Ivanpah Disposal Pond Site leaked to ground water causing concentrations of the following parameters in ground water above background water quality: TDS, strontium, nitrate and barium. Concentrations of these constituents also exceed the level above which impairment of beneficial uses (pollution) occurs as summarized in the attached Table 1. The Discharger has failed to:

- completely define the lateral and vertical extent of the ground water plume;
- define the rate of movement of the plume; and
- implement an adequate Ground Water Corrective Action Program to cleanup ground water.

## 6. History

The Discharger de-activated the Old Ivanpah Disposal Ponds in 1988 and allowed accumulated solid residues in the Ponds to dry in-place. The California Department of Health Services (now Department of Toxic Substances Control (DTSC)) reviewed data provided by MolyCorp on the concentrations of constituents contained in the Pond solids. DTSC classified the remaining solids as non-hazardous on July 21, 1989. On September 13, 1990, the Regional Board revised WDRs under Board Order No. 6-90-56 that included requirements contained in Chapter 15, Title 23, California Code of Regulations (CCR) (Chapter 15). Chapter 15 is currently re-codified in 27 CCR § 20005 et seq.

Board Order No. 6-90-56 included requirements pertaining to closure of the Disposal Facility. As part of preliminary closure work, the Discharger constructed a final cover in 1990 for containment and final disposal of accumulated pond residues (dry).

To address the degraded ground water plume caused by the Pond leakage, WDRs (Board Order No. 6-90-56) require MolyCorp to provide a complete Ground Water Monitoring and Response Program. The WDRs required that the Program include a complete definition of the extent of the plume and implement a Ground Water Corrective Action Program as specified in Article 5 of Chapter 15, which is currently re-codified in 27 CCR §20380 through §20435. To date, MolyCorp has defined part of the plume, the complete vertical and lateral extent is not defined. More investigation of the plume is needed to determine appropriate corrective action.

To obtain pertinent data on the potential impact of radiological constituents to ground water, Board staff requested MolyCorp to conduct radiological sampling of its ground water monitoring wells, and submit the results to the Regional Board. MolyCorp is attempting to complete the requested actions, but is unable to collect samples from all of its monitoring wells. MolyCorp does not have approval of its application to BLM to access land on which some of its wells (including MolyCorp's background monitoring wells) are located. The Discharger has reported it is unable to sample certain wells in order to completely define background water quality for radiological parameters. MolyCorp is in violation of its WDRs for not sampling wells required in its self monitoring program.

The Ground Water Monitoring and Response Program Plan submitted on February 12, 1997 indicates the ground water plume boundary has migrated towards MolyCorp's Ivanpah Water Supply Well Field located southwest of the Old Ivanpah Disposal Pond Site.

## 7. Geology

The waste management unit is situated in the southeast portion of Ivanpah dry lake playa. Lithology below the WMU consists of a transition zone between alluvial fan sediments and playa sediments. Coarse grained sands from the alluvial fan are found intercalated with fine-grained playa silts and clays.

## 8. Hydrogeology

Depth to ground water is 95 feet below ground surface (bgs) at the WMU. Regional ground water gradient is from the alluvial fan towards the playa periphery in a north to northeast direction. Local ground water gradient due to mounding below the site is generally south to southwest which is counter to the regional gradient. Ground water recharge occurs in alluvial sediments of the alluvial fan and playa transition zone. A stratified aquifer system is present below the WMU where two aquifers have been identified at 95 to 120 feet bgs and 140 to 165 feet bgs. Due to the interfingering of alluvial and fan deposits hydraulic conductivity varies between 0.1ft/day and 21.4 ft/day. Highest hydraulic conductivities have been observed to the southwest in the direction of the Molycorp well field which is located approximately 4000 feet away.

Molycorp's ground water production wells are located near the dry lake playa, between one and two miles upgradient of the Facility. Ground water from the peripheral alluvial fan deposits is of good quality and is obtained from depths of up to 800 feet below ground surface. The effects of these and other production wells located within the Ivanpah Valley, such as those located near Primm, Nevada, may influence ground water flow directions in the vicinity of Ivanpah dry lake.

#### 9. Water Quality Control Plan

The Regional Board adopted an amended Water Quality Control Plan for the Lahontan Region (Basin Plan), on March 31, 1995.

#### 10. Beneficial Uses

The beneficial uses of ground waters of the Ivanpah Hydrologic Unit (612.00) and Ivanpah Basin (6-30) as set forth and defined in the Basin Plan are:

- a) Municipal and Domestic Supply (*MUN*)
- b) Agricultural Supply (*AGR*)
- c) Industrial Service Supply (*IND*)
- d) Ground Water Recharge (*GWR*)

Board staff evaluation indicates MUN is the most sensitive beneficial use of ground water in the vicinity and southwest of the plume.

#### 11. Water Quality Objectives

For the purposes of this Cleanup and Abatement Order, naturally occurring background water quality is referred to as the Background Water Quality Objective (WQO), which is also referred to as the Non-Degradation WQO. The Basin Plan establishes cleanup standards for Waters of the State at the Background WQO. A discharger may submit a request for a ground water cleanup standard greater than the Background WQO but not to exceed the Upper WQO (described in the next section). The Regional Board reviews information submitted by a discharger to support such requests. Based on this information and information provided by other interested parties, the Regional Board determines whether a request can be approved; and if it can be approved, the basis on which approval can be granted. At the present time, the Discharger has not submitted such a request.

12. Violations

Pollutant concentrations listed in the attached Table 1 are in violation of the two narrative WQOs contained in the Basin Plan, which are:

- (1) the Upper WQO that states: "Ground waters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) ....., " and
- (2) the Background WQO that states: "existing high quality shall be maintained until or unless it has been demonstrated to the State that any change in water quality will be consistent with the maximum benefit of the people of the State, and will not unreasonably affect present and probable future beneficial uses of such water."

Pollutant concentrations in the ground water (see Table 1) are adversely affecting the MUN beneficial use listed in the Basin Plan for the ground water. The contaminant concentrations, therefore, constitute a pollution, as defined in California Water Code (CWC) §13050. Because the boundary of the plume is not defined and may be migrating, it threatens to violate WQOs for downgradient ground waters. The Discharger has failed to implement an acceptable Ground Water Monitoring and Response Program as required by 27 CCR §20380 through §20435.

13. Reason for Action

As described in the previous findings, the Discharger has discharged wastes into waters of the State in violation of WDRs and has created and threatens to create a condition of pollution.

14. Section 13304

CWC §13304 states in part: "Any person who has discharged or discharges waste into waters of this state in violation of any waste discharge requirement or other order or prohibition of a regional board.... or who has caused or permitted ... or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the State and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the Regional Board cleanup such waste or abate the effects thereof or, in case of threatened pollution or nuisance, take other necessary remedial action."

15. California Environmental Quality Act

This enforcement action is being taken by this regulatory agency to enforce provisions of the CWC and, as such, is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, §21000 et seq.) in accordance with 14 CCR §15321.

**IT IS HEREBY ORDERED** that, pursuant to CWC §13267 and §13304, the Discharger shall:

1. In accordance with the schedule below, implement a Ground Water Monitoring and Response Program as required by Article 5, Chapter 15 (currently re-codified in 27 CCR §20380 through 20435) that:
  - a. will contain the plume boundary and thereby cease violations and threatened violations of Basin Plan WQOs for downgradient ground waters, and
  - b. will, in a timely manner, cleanup and abate the effects of pollutants in ground water that are present at concentrations violating Basin Plan WQOs.
2. By **June 1, 1998**, submit to the Regional Board a **Draft Site Investigation Workplan** to conduct an investigation to determine the characteristics, and vertical and areal extent of contaminants in soil and ground water beneath and in the vicinity of the site. The following shall be included:
  - a. **An Evaluation of Design and Construction for Existing Ground Water Monitoring Wells** to determine if any wells are or may be acting as vertical conduits for transporting either surface water or pollutants. (Include conclusions and recommendations for each existing well, including recommendations for wells that need to be destroyed.)
  - b. **A Field Workplan** showing maps and design plans describing the proposed number, locations and designs of soil and ground water monitoring points. The proposed monitoring points shall be sufficient to locate the following boundaries:
    - i. The background WQO Boundary, which is defined as the boundary surrounding the ground water monitoring points where one or more Background WQO is exceeded.
    - ii. The upper WQO Boundary, which is defined as the boundary surrounding the monitoring points where one or more Upper WQO listed in the attached Table 1 is exceeded.
    - iii. Isoconcentration boundaries for each of the Upper WQOs listed in the attached Table 1.
    - iv. Contaminants in soil which may pose a threat to water quality.
  - c. **A Health and Safety Plan.**
  - d. **A Sampling and Analysis Plan** including field and laboratory methods for all Constituents of Concern and laboratory Quality Control/Quality Assurance.
  - e. **A Investigation Derived Waste Disposal Plan.**
  - f. Any proposals for **interim corrective action**.

This plan shall be coordinated with similar plans developed or being developed in response to the Emergency Order issued June 27, 1997 by the Radiological Health Branch of the California Department of Health Services, the Notice of Non-Compliance issued by BLM on July 18, 1997 and

the Amended Cleanup and Abatement Order issued by the San Bernardino County Fire Department Hazardous Materials Division.

3. By **July 1, 1998**, submit a copy to the Regional Board of any complete **Application(s) for Land Access** that were sent to adjacent landowners to request permission to conduct site investigation required for compliance with this Cleanup and Abatement Order.
4. By **August 15, 1998**, submit a **Final Site Investigation Workplan**, including the information described in item 5a) through f), above, and addressing comments received on the Draft Site Investigation Workplan.
5. By **October 1, 1998**, implement the **Site Investigation Workplan**.
6. By **February 1, 1999**, submit to the Regional Board a **Site Investigation Report** describing the investigation. The following shall be included:
  - a. A description of work performed, tabulated analytical results, well logs, copies of laboratory reports, waste classification and disposal locations for drill fluids, and other relevant information.
  - b. Plan-view and cross-sectional-view maps, which include:
    - i. the Background and Upper WQO Boundaries, and isoconcentration boundaries described in Order No. 2.b., above;
    - ii. areas up to 2.0 miles beyond the boundary of affected ground water ;
    - iii. ground water table equipotential contour lines;
    - iv. cross sectional maps showing contaminant concentrations and background concentrations in soil;
    - v. property boundaries;
    - vi. boundaries of US Geologic Survey sections, townships and ranges;
    - vii. buildings, dwellings, and other significant structures; and locations of existing monitoring and water supply wells (both active and inactive), including ownership of the land on which the wells are constructed.

7. By **February 1, 1999**, submit to the Regional Board a **Feasibility Study Report** evaluating appropriate Ground Water Corrective Action alternatives that includes, but is not limited to:
  - a. results of mathematical modeling including cleanup time estimates and projections for any proposal to allow plume boundaries to migrate,
  - b. cost evaluations, and
  - c. the Discharger's recommended cleanup alternative.
8. By **March 15, 1999**, the Discharger shall submit a **Revised Report of Waste Discharge** for revision of WDRs, including the following:
  - a. A report containing a revised **Water Quality Monitoring and Response Program** complying with the requirements of 27 CCR §20380 through 20430, which includes a **Ground Water Corrective Action Program** proposal.
  - b. A revised **Closure and Post-Closure Maintenance Plan** complying with 27 CCR § 21400.
  - c. A revised **Instrument of Financial Assurance** adequate to cover the costs of Closure, Post-Closure Maintenance and all Known and Reasonable Foreseeable Releases for the entire Facility.
  - d. A **Cleanup Level/Degradation Analysis Application** to the Regional Board for any proposed cleanup standards greater than background or proposals to allow plume boundary migration, in the event the Discharger's recommended alternative involves such proposals.
  - e. A **Time Schedule** for implementing the Ground Water Corrective Action Program.
9. Within **30 days following approval** of the Feasibility Study Report, implement an acceptable Ground Water Corrective Action Program.
10. All work plans and technical reports are to be reviewed and signed by a California Registered Geologist, Civil Engineer, or Certified Engineering Geologist. Additionally, all of the field activities are to be conducted under responsible charge of one or more of these professionals.

The Executive Officer is authorized to name adjacent landowners as Dischargers, and amend this Cleanup and Abatement Order naming them, if they fail to provide MolyCorp with full property access in a timely manner to allow off site investigation and routine monitoring work to proceed.

Failure to comply with the terms or conditions of this Cleanup and Abatement Order will result in additional enforcement action that may include the imposition of administrative civil liability and/or referral to the Attorney General of the State of California for such legal action as he or she may deem appropriate.

Ordered by: \_\_\_\_\_

HAROLD J. SINGER  
EXECUTIVE OFFICER

Dated: \_\_\_\_\_

Attachment: Table 1

caoold

**Table 1**

[Concentration for Non-radiological and radiological parameters are in milligrams/liter and picocuries/liter, respectively]

Parameters	Water Quality Objectives		Maximum Concentrations in Ground Water Plume
	Background Objectives (Well IER-2)	Upper Objectives <sup>1</sup>	Well D-1 (unless noted otherwise) <sup>2</sup>
Total Dissolved Solids (TDS)	295 <sup>3</sup>	500	9,218 <sup>3</sup>
Strontium	0.64 <sup>3</sup>	4.2	41.2 <sup>3</sup>
Nitrate as N	1.6 <sup>4</sup>	10	80
Barium	0.074 <sup>4</sup>	1	6.2 <sup>5</sup>
Gross Alpha	Unknown <sup>6</sup>	15	153 <sup>7</sup>
Gross Beta	Unknown <sup>6</sup>	50	859 <sup>8</sup>
Uranium	Unknown <sup>6</sup>	20	8
Radium	Unknown <sup>6</sup>	5	4.7

<sup>1</sup> All objectives are the Primary Maximum Contaminant Level (MCL), with the exception of the objectives for TDS and Strontium. The objective listed for TDS is the Secondary MCL. The objective for Strontium is the US Environmental Protection Agency (USEPA) Lifetime Health Advisory, which is based on data published in the USEPA's Integrated Risk Information System (IRIS) for waters used in domestic supply systems.

<sup>2</sup> Nitrate, barium, and radiological results are the maximum for two sampling rounds conducted by Molycorp staff in the third and fourth quarter of 1997.

<sup>3</sup> Average of 29 strontium readings and 36 TDS readings reported in Fourth Quarter 1997 Self Monitoring Report.

<sup>4</sup> Background for nitrate and barium are for one sample collected in second quarter of 1997.

<sup>5</sup> Well IEI-5U

<sup>6</sup> The landowner (Federal Government, Bureau of Land Management) has not approved Molycorp's application for access to sample this background ground water monitoring well.

<sup>7</sup> Well D-4

<sup>8</sup> Well IEI-2L